

**REMARKS**

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 2 and 28-30 are pending in the application.  
Claims 2 and 28-30 stand rejected.

**Claim Rejections Under 35 USC §112**

Claim 2 is rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claim 2 has been cancelled and withdrawn from further consideration by the Examiner.

**Claim Rejections Under 35 USC §102**

Claims 2 and 28-30 are rejected under 35 USC §102(e) as being anticipated by Chang et al '806. It is contended that Chang discloses claimed damascene structure by electroplating and furthermore, Chang discloses that the grain structure would be large depending on the seed layer.

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The rejection of claims 28-30 under 35 USC §102(e) based on Chang et al is respectfully traversed.

Chang et al '806 discloses a method to improve the roughness of metal deposition on low-k material. At col. 2, lines 4+, it is stated "a smooth and strongly textured copper seed layer is required to assure that the overlaying layer of copper (that makes up the damascene plug) is highly textured and has a large grain content".

The Applicants respectfully submit that, throughout the Chang et al reference, there is no teaching of the present invention independent claim 28:

"Claim 28. A semiconductor structure of a damascene or dual damascene interconnect formed by a trench-filling process of electroplated Cu having an as-deposited **grain size of not less than 0.5  $\mu$ m and a decrease in electrical resistance of at least 15% after a time period of not more than 30 hours at about 21°C."**

To anticipate a claim of a patent, the reference must teach every element of the claim. (MPEP §2131) "A claim is

anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference", Verdegaal Bros. v. Union Oil Co. of California, 2 USPQ 2D1051,1053 (Fed.Cir. 1987). The Applicants respectfully submit that Chang et al does not teach each and every element of the present invention independent claim 28.

The rejection of claims 28-30 under 35 USC §102(e) based on Chang et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 2 and 28-30 are rejected under 35 USC §102(e) as being anticipated by Cohen '707. It is contended that the Cohen reference discloses the claimed damascene formed by electroplating.

The rejection of claims 28-30 under 35 USC §102(e) based on Cohen '707 is respectfully traversed.

The Applicants respectfully submit that, contrary to the Examiner's contention that the Cohen reference discloses the claimed damascene formed by electroplating, the present invention

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teaches and claims more than just the formation of a damascene by electroplating. For instance, independent claim 28 clearly recites that "the interconnect structure has a grain size of not less than 0.5  $\mu\text{m}$  and a decrease in electrical resistance of at least 15% after a time period of not more than 30 hours at about 21°C". Such is clearly not taught or disclosed by Cohen '707.

The rejection of claims 28-30 under 35 USC §102(e) based on Cohen is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claims 2 and 28-30 are rejected under 35 USC §102(e) as being anticipated by Woo et al '086. It is contended that Woo et al '086 shows the claimed damascene formed by electroplating.

The rejection of claims 28-30 under 35 USC §102(e) based on Woo et al is respectfully traversed.

As presented above, the present invention independent claim 28 clearly recites "interconnect formed by a trench-filling process of electroplated Cu having an as-deposited grain size of not less than 0.5  $\mu\text{m}$ ", which is clearly not taught or disclosed by Woo et al.

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The rejection of claims 28-30 under 35 USC §102(e) based on Woo et al is respectfully traversed. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 28-30, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Tung & Associates

A handwritten signature in black ink, appearing to read 'Randy W. Tung', is written over a horizontal line. The signature is stylized with a large, circular loop at the beginning.

Randy W. Tung

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